Theoretic Design of Differential Minimax Controllers for Stochastic Cellular Neural Networks and its Applications

Ziqian Liu

Abstract

The past two decades have witnessed enormous advances in engineering and in computer science to build computational intelligence systems, among which cellular neural networks are being implemented by using microprocessor chips and have been readily applied to many scientific and engineering fields such as, pattern recognition, image processing, DNA micro-array analysis, satellite data transmissions, etc. In this presentation, I'll introduce one of my latest research achievements, Theoretic Design of Differential Minimax Controllers for Stochastic Cellular Neural Networks, published by the peer-reviewed journal, *Neural Networks* (Publisher: Elsevier). Theoretic developments, simulation results, and potential applications will be discussed through this talk.

Navigating the Fourth Dimension

Debbie Yuster

Abstract

The mention of a "fourth dimension" may conjure visions of science fiction and time travel, but to a mathematician, four dimensions are just a generalization of the 2-dimensional Euclidean plane geometry you learned in high school. Instead of representing a point by an ordered pair of x- and y-coordinates, a point's location is given by four coordinates. This allows us to construct "shapes" in four dimensions. When moving from two dimensions to three, circles become spheres, squares become cubes, and triangles become pyramids. What happens when we try to move these familiar shapes into the fourth dimension, and how can we understand objects we can't see? Moreover, what is the practical value of higher-dimensional shapes? Come explore these questions and more. No special 3-D or 4-D glasses necessary.

Economic Panel

The Status Quo isn't what it used to be

Cornelia McCarthy

Abstract

The recession that started in December of 2007 and the US economy's recovery from the low point of the cycle in June 2009 is different from other post WWII recessions because it can be identified as the end of a 30 year structural change in the US Economy. The most apparent structural change is the decline of manufacturing in the US economy. Manufacturing as a share of GDP declined from 20% in 1980 to 11.2% in 2009. While most of us were aware of this decline and of the benefits from growth in the service sector, the decline during this recession was surprisingly hard. From the cycle peak of 2007 to the trough of 2009 total non-farm employment in the US declined by 5.7% and GDP declined by 2.8%. From the cycle peak to trough employment in manufacturing declined by 16.7% and manufacturing output declined by approximately 8.3%. In addition to the decline in manufacturing, the structure of the US economy has been affected by a growing current account deficit and a decline in our savings rate. The result of these changes to the structure of the economy is that while the level of output produced has returned to and is growing beyond the level it was at the cycle peak of December 2007 employment has not recovered and appears that it will not recover soon.

Economic Panel

Economic Tools to Move the Economy Forward

Sam Yahalom

Abstract

The economic slump since 2008 has highlighted the question of what can be done to get out of this predicament and return to normal economic performance. Historically the economic targets were about 5% to 5.5% natural unemployment rate, about 2% to 3% inflation and about 2.5% to 3% growth. Economic theory and practice recognize two key instruments to resolve economic difficulties; the instruments of monetary and fiscal policies.

The economic problem is lack of sufficient demand due to an insufficient number of jobs and lower income in many jobs. Furthermore, uncertainty in the future and the lowering of real estate value cause individuals to refrain from spending.

The first choice is always the monetary policy using the interest rate rule and/or the money supply rule. This key instrument should work relatively quickly in resolving economic difficulties.

Since the slump, monetary policy has been used and many new tools within the monetary policy were created. The common denominator in their creation was to make money available or to remove its possible constraint on economic development and growth without a concern for inflation. However, this did not work. The economy is in a liquidity trap.

The second choice is fiscal policy using taxation policy and government spending to fix the economy. This instrument works slowly and has to be approved by Congress and the president. The political debate of the last few years concentrates on issues of taxation and debt. Not enough has been done using fiscal policy, even though to get out of a liquidity trap the instrument to use is fiscal policy.

We are in a political wait-and-see pattern before the election. However, an important signal of change could be inflation which would encourage spending and change expectations.

Economic Panel

Limits to Economic Growth

Riccardo Pellicciaro

Abstract

The thesis of my presentation can be summarized as rather pessimistic: given the level of pessimism caused by high U.S. unemployment, budgetary problems, European austerity measures, etc. the measures taken by the Federal Reserve System and the U. S. Treasury had, at best, a weak impact and, at worst, no impact at all.

Monetary policy

The Fed expanded its balance sheet by 2.4 trillion dollars since 2007. (It expanded from .8T to 3.2T).This unprecedented growth of the monetary base reduced interest rates to nearly zero but was unable to increase consumer and business spending because the economic system was under the grip of a truly Keynesian *liquidity trap*. Money was created only to be hoarded. Banks have 1.2 trillion dollars in excess reserves deposited at the very Fed that created it. Corporations are flushed with 1.1 trillion in their treasuries. Thus much of the money created by the Fed is being hoarded by banks and corporations and is unable to stimulate the economy and reduce unemployment. These facts also explain the calmness that the Fed feels about its policies not

being inflationary since money was created but not circulated. Thus monetary policy always a weak tool in combatting recessions was superbly ineffectual in this case.

Fiscal Policy

This is a case of too little since fiscal policy also faced a major trap—an *income trap*. In 2007-8 major efforts were made by congress via the TARP to provide aid to sectors in difficulty such sectors as autos, banks, home purchasing in order to provide a cushion to unemployment. However, as income was spent by fiscal policy measures, the hoarding of this income in the form of saving and credit rebalancing by frightened households, did not allow and income multiplier to initiate and therefore these measures became stop gap measures with a limited and finite impact that checked further deterioration of the economy but was unable to stimulate it. Political divisions within congress (tea party, split republican leadership and outdated liberal positions etc.,) and fear or capital market reaction to put a limit on further fiscal policy.

Given the weak impact, if not failure, of these policies, the new normal appears to be a rather long period of high unemployment and limited growth for the U. S. economy as excesses work themselves out.

The discussion that pursued among the panel and the attendees suggested that what was needed was possibly a new revolutionary and culture changing innovation that in the long run would stimulate investments and restore confidence thus reducing unemployment.

Economic Panel

Coping with Change: Business Prospective

James Drogan

Abstract

The world has become a messy place.

The external business drivers to which organizations must respond have achieved levels of unpredictability and velocity of change that most of us would not have imagined just a few years ago. The business of business has become increasingly problematic.

This turbulence is made manifest in the volatility of global finance and economics, the ebbs and flows of global trade, the polarization of the distribution of wealth, and increasingly tenuous relationships between and within nations and cultures.

The world is one “permanent whitewater” and is likely to remain that way well into the foreseeable future.

Still, one must find a way to survive and thrive amidst this storm. This discussion is about some ideas on managing through the turbulence.

Balancing Commitment versus Compliance in Maritime Industry Management – How Can We Teach Critical Thinking and Creative Problem Solving?

Gregory Hanchrow

Abstract

During the evolution of the maritime industry and its personnel over the past generation, there has been an exponential increase in the use of a systemic approach to identifying goals, developing processes to achieve them, and utilizing metrics to benchmark progress.

System development has produced an interesting dilemma specifically relating to shipboard personnel including the definitive change in “management level” requirements of officers and the expectations of shore based administrators.

The skill sets for managing the maritime operation ashore have typically progressed passed the ability to gain these skill sets while at sea. Ultimately the risk arises that shore based and sea going personnel grow apart in understanding the elements that were once common. It is possible to identify a dilemma of “Commitment vs. Compliance” where one can find examples of commitment to compliance alone instead of commitment to the intent of the regulations or policies that are being complied with.

Traditional Maritime Education focuses on standard maritime concepts developed slowly over time and with great emphasis on institutional experience. These skills emphasize the route toward increased proficiency as measured against an increasingly accepted metrics based standard. Specifically assessment based qualifications. Potential risks could develop as a result of isolating maritime students into a method of learning from their initial exposure to maritime education and thus habitually gauging their development against formalized metrics. In other words, will the maritime student learn that continuing development in their career is to be obtained by “checking the box” on a pre-established criteria or doing so alongside with the need to develop and practice analytical skills that promote creative process to solving problems (that ultimately exist in the most inopportune moments)?

Can curriculum be developed with the idea that practicing critical analysis in a maritime environment is a way to help promote creativity and problem solving ability? Aside from the

accepted benefit that assessment based learning emphasis brings to a technical industry like ours, the ability to creatively and independently think and solve problems is tantamount to a successful future of global maritime education and enterprise.

Film Noir America

John Rocco

Abstract

"Someday fate or some mysterious force

can put the finger on you or me for no reason at all."

--Tom Neal in the classic B-movie Film Noir *Detour* (1945)

Of all the products of Hollywood, film noir is the most fascinatingly slippery to define. We usually describe its classic phase as beginning with 1941's *The Maltese Falcon* (the film that made Bogart, one of the great faces of noir, a star) and ending with Mike Hammer witnessing the end of the world when "the great Whatsit" is unleashed in *Kiss Me Deadly* (1955). Or maybe the first cycle of noir ends with Orson Welles' *Touch of Evil* (1958)—one of his greatest films and his second full-blown noir after Rita Hayworth became one of the great femme fatales as *The Lady from Shanghai* (1947). Or maybe Hitchcock ended it with *Psycho* (1960), a potent little film that changed movies altogether.

Anyway we care to date it, film noir can be defined as a powerful and revealing aspect of American popular culture. The French thought so when they saw American films after WWII; they were shocked and fascinated by the pessimistic and tough, almost existentialist tone these dark films had and what they said about the world. These intriguingly strange films shared a common, disturbing message: It's a dark universe out there and someday fate or some mysterious force will crush you. And that's what the French called them: film noir.

Film noir is not a film genre like the Western or the horror film; it is more accurately described as a film *style.* This style always conveys a certain dark mood about the world and the motives of the people in it. It's America's tragic vision, the distorted mirror image of the American Dream. It was born of a vibrant mix only available in the great dream factory of the Hollywood Studio System: German Expressionism lighting the pulp world of American hard-boiled crime fiction. The classic phase of noir may be over, but the influence and life of noir is everywhere, from the neo-noir sci-fi classic *Blade Runner* (1982) to Frank Miller's graphic novels that were filmed as a noir world in *Sin City* (2005). Film noir lives throughout the work of some of our most

important filmmakers including David Lynch, the Coen Brothers, Quentin Tarantino, Brian De Palma, and Martin Scorsese.

20th Century Unlimited: Meet Sally Benson in St. Louis, Manhattan, Madison, CT, Dorset, VT, and Hollywood--All Aboard?

Keefe Maryellen

Abstract

Sally Benson emerges from my research as a writer who succeeded early in a profession dominated by men. Her economy of language, her witty, often poignant portraits of lonely women, awkward adolescents, and middle-class suburbanites plus her skill in handling the short story made Benson a household name among magazine readers from 1929-1956. Having lived in many states through the Jazz Age and two world wars, she renders the woman's perspective on American life from many vantage points: adolescent, wife and working mother, professional writer of fiction, stage, TV and screen plays, participant in "casual little affairs" with both celebrity and unknown.

Sally Benson exemplified the transition from domesticity to the marketplace, becoming a full-fledged career woman while juggling her responsibilities as wife and mother, and indulging in extra-maritial friendships while maintaining friendship with her spouse. What made her so attractive? What demons did she battle? Come and see.

Where is Turkey Headed? The Current State of US-Turkish Relations and Prospects for the Future

Mark Meirowitz

Abstract

Turkey is a key ally of the United States and a partner of the US in NATO. Turkey’s future course is of fundamental importance to the US. The current state of US-Turkish relations will be discussed, as well as prospects for the future. Turkey has asserted itself forcefully in its region and internationally. It would appear that there has been a change in Turkey's world vision, which may represent a change in axis and direction, with Turkey reorienting itself from its alliance with the West and the United States. Turkey's Iran policy has complicated, and even damaged, Turkey-US relations. Legislative actions in the US Congress have also been of deep concern to Turkey’s leaders, with considerable effort expended to stave off legislation in the US Congress

considered by Turkey to be anathema to Turkish interests. The recent struggle over such legislation will also be examined.

Hydrogen Based Shipping

Yaqub M. Amani

Abstract

Environmentally clean ocean going vessels are becoming a requirement for future generation of cargo and other types of ships. Hydrogen has been cited as potential fuel for creating a new maritime industry which is promising and forward looking. An advanced system and potentially viable shipping economy, based on hydrogen, is the subject of this paper. The combined use of tidal, wind, wave and solar energy for generating electricity, will provide sufficient power to generate hydrogen to use as fuel for ships. The latest developments in fuel cell technology, hydrogen storage and hydrogen reforming technologies points to a new direction in Maritime Shipping Technology.

The New Maritime College Hydrodynamics Laboratory

Carl Delo

Abstract

A new hydrodynamics laboratory has been installed in the engineering department at Maritime College. The heart of the laboratory is a recirculating flow channel, essentially a wind tunnel but with water as the working fluid. Flow channels are versatile teaching and research tools, and ours is expected to become an important asset within the engineering department. This talk will introduce the lab to the Maritime College community, both as a teaching tool for engineers and naval architects, and as a resource for collaborative research. A central component of the lab will be high-speed flow visualization studies, and initial results will be presented. Near- and long-term research plans will be discussed, and suggestions for research from the audience will be encouraged.

Environmental Policy Workshop for Planning for Climate Change - Weathering Uncertainty

Walter Nadolny

Abstract

This will be discussion of the maritime implications associated with global warming. In opening the session I will present a broad outline of the effects of increased marine traffic and commerce. This will be broken down by segment, tourism, minerals extraction and passage. We will look at the possible effects in three timeline scenarios, immediate, interim, and long term. The participants should identify their community and its location. They should also identify the unique cultural and natural resources of the area as well as it's proximity to sea. From there we can begin discussing what effects and changes they foresee. At that point we will look at the scenarios common to the communities and discuss the possible effects from a cultural-environmental-economic perspective. We will look at the tools available for mitigation. These tools may be legal, economic or social policies which may augment existing remedies.

At the conclusion of the workshop participants will be more aware of the warming of the arctic from a maritime perspective and incorporate that into local, regional and provincial planning.

Outcome – Participants will be made more aware of the maritime implications of global warming. They can take this back to their communities and incorporate the information into planning.

"Stretching the Boundaries of a Discipline – Adventures of a Biogeochemical Oceanographer by Land and by Sea"

Marie A. de Angelis

Abstract

Biogeochemical oceanography is an interdisciplinary and multidisciplinary field. In this presentation, I discuss oceanographic and aqautic research endeavors of mine which have integrated the disciplines of chemistry, microbiology, biology, geology, and geochemistry. Specifically, I describe my research in four different areas involving marine methane biogeochemistry: (1) the fate of dissolved methane from hydrothermal vents and its contribution to deep-sea productivity; (2) production of methane by copepods and insights into how methane is produced in oxic regions of the water column; (3) the role of methanotrophic bacteria in consuming methane escaping from decomposing methane hydrates on the continental

shelf and preventing a runaway greenhouse effect; 4) a possible negative feedback loop controlling global climate involving methane oxidizers and alpha-pinene from coniferous trees.

Mission Critical Quality – *Managing Processes When Failure Is Unthinkable*

Richard Burke

Abstract

Modern quality management practices, emphasizing process control and robust design, have shifted attention away from inspection; however, inspection still has an important role to play in *mission critical* applications. The presentation will review the application of inspection planning to mission critical activities, and then discuss why these are inadequate for security screening activities as typified by the problem of screening incoming shipping containers at seaports.

The Context of Interest

Jim Drogan

Abstract

John Donne wrote, “No man is an Island, entire of itself; every man is a piece of the Continent, a part of the main;…” And so it is with elements of the Context of Interest. No part stands alone. No part can be considered apart from its contexts. The relationships between the parts should not be severed.

The Context of Interest serves to remind us of the breadth and depth of the investigation we must carry out if we are to understand how an organization functions and, based on that understanding, how it might be made to work better.

Derivatives in Financial Markets and Some Applications in Freight Markets

Suleymen Hilimi Kal

Abstract

Although the usage of derivatives goes all the way back to Ancient Greek (Thales's bet on the wine production in ancient Greece by a call option (told by Aristodle)), derivatives have never

become important for the economy as they are today. By some accounts the total volume of derivatives reached to one quadrillion dollars. There are numerous types of derivatives available for hedging or speculative purposes. In this presentation, after briefly explaining the history of derivatives, main type of derivatives will be discussed and some freight forward derivative strategies will be analyzed.

Research on Industrial Polishing – What's the Rub?

Joseph Levert

Abstract

An industrial polishing process, chemical mechanical polishing (CMP), is vital in the manufacturing of integrated circuits – computer chips. CMP is done by rubbing an abrasive containing slurry against the computer chip surface with a soft polishing pad. Smaller, more delicate surface features on these advanced integrated circuits can be damaged by the friction that is a natural consequence of any polishing process. This research project involves Maritime Students, at the Tribology Research Laboratory at the Maritime College, in collaboration with Stony Brook U. to define the source of this damaging friction – and possible strategies for reducing it.

Experimental research, done by Students at the Tribology Research Laboratory, has determined that friction changes as a function of the abrasives used in the polishing slurries. These results mirror published data showing changes in polishing rates as a function of slurry abrasives. Experimental data suggests that polishing is effected by a mechanism which gently brushes the abrasive against the integrated circuit as opposed to grinding it into the surface. This mechanism was first conceived this past May, and it is a very novel idea in this field of research.

Richard Wright and the Jews: An Intersection of Life and Letters

Karen Markoe

Abstract

Richard Wright, best known as the author of the autobiographical *Black Boy* and the novel *Native Son,* grew up in Mississippi during the era of lynching and other manifestations of Jim Crow racism. Like many other young Blacks of his generation, he moved North during the 1920's, first to Chicago, then to New York. At the end of World War II, following his marriage to a Jewish woman from Brooklyn and the birth of a daughter, he and his family moved to Paris

to escape racism and the additional opprobrium from a mixed-race marriage. Wright actually was married twice and both his wives and many of his numerous lovers were also Jewish. I wondered about this, and made it the subject of my research.

A version of the paper was delivered at a conference at the American University of Paris to celebrate the centennial of Wright's birth. The University of Mississippi Press will include it in a soon to be published book on Richard Wright.

The First Record of the Oriental Shrimp, *Palaemon macrodactylu,* from the Eastern Coast of North America*

Barbara E. Warkentine

Abstract

An oriental shrimp, *Palaemon macrodactylus*, native to estuarine waters of Southeast Asia has been reported outside of its normal range. The occurrences beyond its normal area have been well documented and its disjunct distribution strongly speaks for its transport being attributed to ballast water. In this paper we report the first record of *P. macrodactylus* from the eastern coast of the United States and in the estuarine system of New York City (NYC). While this animal has been reported to have crossed the Pacific, and has been found in the eastern Atlantic along the coasts of Spain, France, Germany and the British Isles, and in the southwestern Atlantic off the coast of Argentina, it has not been previously sighted in the northwest Atlantic. Our preliminary life history data indicate that the size range for the 98 adult individuals in the 2001 collection was from 2.05 to 5.05 cm, and exhibited a one to one sex ratio. The finding of gravid females among these shrimp collected from 2001 – 2002, and again in 2008 indicates that the oriental shrimp populations in the coastal waters of NYC have become established, and show reproductive activity from May through October. Further studies are required to evaluate whether *P. macrodactylus* poses a threat to native aquatic organisms in this region.

*This paper has been accepted for publication and will appear in the March 2010 issue of the Northeastern Naturalist Vol 17, Number 1, 11pp.

Historiography, Archives, and the Origin of Maritime College:

The New York Nautical School

Joe Williams

Abstract

Founded in 1874, the New York Nautical School has a long history with even longer antecedents. This presentation examined the archival sources for the study of the New York Nautical School and their context. Also discussed, were the causes for the establishment of the institution, the role of Stephen B. Luce in promoting maritime education, the institutional history of the school until 1908 as well as the daily lives of the crew and students.

Alluring Androids, Robot Women, and Electronic Eves

Julie Wosk

Abstract

Filmmakers, photographers, and artists have long been fascinated by the idea of artificial women that seem alive. The Stepford Wives, Lara Croft, the latest in female Japanese robots look so real they can easily fool the eye. Images of female robots, androids, mannequins and other artificial women ranging from early automatons to lifelike female heroines in today's video games tell a startling tale of changing attitudes toward science and toward women themselves. The virtual women also raise provocative questions: What happens when we can no longer tell the difference between an artificial woman (or man) and a real one? Will these ultra-realistic robots challenge our humanity or enhance our lives? This research and talk is an outgrowth of Julie Wosk's book *Women and the Machine* (Johns Hopkins Univ. Press) and her Fort Schuyer Press book *Alluring Androids, Robot Women, and Electronic Eves*.

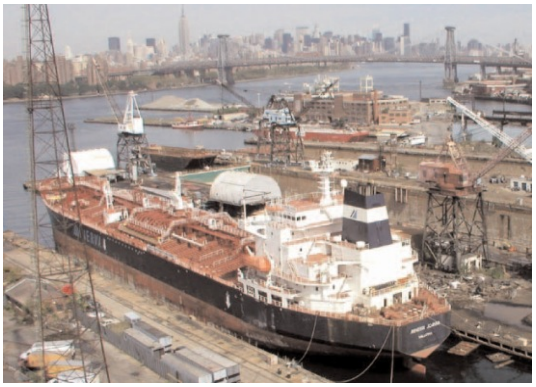
Maritime Support Services in New York Harbor and Their Impact on the Region

Shmuel (Sam) Yahalom

Abstract

This study was carried out on behalf of the New York City Economic Development Corporation (NYCEDC) and the Brooklyn Navy Yard Development Corporation (BNYDC).

The study conducts a Maritime Support Services Location analysis of six New York City designated locations. The study identified the existing maritime support services in New York City and determined the maritime support service needs for the future. The study takes into account the changes in the industry and its impact on contemporary support services and future needs.



The study major findings indicate that the Port of New York generates more than $18 billion in international and domestic economic activity annually, serving more than 221 million DWT and nearly 5000 international vessels (deep draft) trip calls in 2005. The maritime support service industry carried the equivalent of 3.9 million truck trips of liquid and dry cargo in 2005. The Port of New York growth rate of tanker and container vessel exceeds the national level. Furthermore, the maritime support services industry employs 11,870 individuals, its economic impact is over $2 billion annually, and the average tugboat handled is 381.8 thousand tons with an average value of $596 million in 21,000 calls for service (2005). The study findings also address the need for dry docks. The port has 18 dry docks of which four are graving docks. The port is short seven dry docks to accommodate regulation, inspection and maintenance demand. The berthing space is mostly in 'good' condition (52%).

The study recommendations include: develop a maritime support service policy, create a seaport planning authority or agency, preserve existing berthing areas for the industry, encourage building more dry dock facilities, and develop a network of tie-up sites or hubs in each borough; thus, the hubs could also be used as emergency response facility, commercial center, recreation and education facility, and a transit stop for water transit. The study also recommends establishing of a mooring buoy zone, increasing the use of maritime transportation, and providing support in the form of investments, zoning, space allocation, permits, etc. Finally, the study recommends carrying out additional studies. Some of the study recommendations were already adopted and implemented by the City Council.

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The executive summary and the study are available upon request from the PI.